

## In the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

### Listing of Claims

1. (Original) A survivor path decoding apparatus for a Viterbi decoder with a constraint length of  $K$ , comprising:

a best survivor unit for receiving path metrics of  $2^{K-2}$  local winner states from which a best state is selected every  $L$  iterations, said local winner states are chosen from  $2^{K-2}$  pairs of odd and even states, respectively; and  
a survivor memory comprising:

a register-exchange network for receiving decision bits of  $2^{K-1}$  states and generating decision vectors of survivor paths leading to said  $2^{K-1}$  states at instant  $i$  according to said decision bits of said  $2^{K-1}$  states from instant  $i-L$  to instant  $i$ , wherein said  $2^{K-1}$  states are divided into said  $2^{K-2}$  pairs of odd and even states, said decision vectors of said  $2^{K-1}$  states are output every  $L$  iterations, and each of said decision vectors has a length of  $L$  bits [[and]]; and

a trace-back unit for storing said decision vectors of said  $2^{K-1}$  states and finding a global survivor path sequence by following said decision vectors back from the best state at instant  $i-L$ , such that  $L$  decoded bits are output every  $L$  iterations.

2. (Original) The apparatus as recited in claim 1 wherein said best survivor unit comprises  $\gamma$  2-to-1 comparators for choosing the best state among said  $2^{K-2}$  local winner states by comparing said path metrics of said  $2^{K-2}$  local winner states in  $L-1$  iterations.

3. (Original) The apparatus as recited in claim 2 wherein the number of said 2-to-1 comparators,  $\gamma$ , is given by:

$$\gamma = \left\lceil \frac{2^{K-2} - 1}{L - 1} \right\rceil$$

where  $\lceil \cdot \rceil$  denotes a ceiling function.

4. (Original) The apparatus as recited in claim 1 wherein said number of  $L$  is equal to a divisible factor of a data payload length for a conformant 802.11g system.

5. (Original) The apparatus as recited in claim 4 wherein said number of  $L$  is equal to 8 for said conformant 802.11g system.

6. (Original) The apparatus as recited in claim 1 wherein said survivor memory features a decoding window length of  $\Gamma = L(L - 2) + K - 1$ .

7. (Original) A rate  $1/n$  Viterbi decoder with a constraint length of  $K$  comprising:

- a branch metric generator for computing a plurality of branch metrics, each of which is a distance between a corresponding branch label and a currently received data symbol including  $n$  decision metrics;
- an add-compare-select module, responsive to said branch metrics, for generating decision bits of  $2^{K-1}$  states along with path metrics of  $2^{K-2}$  local winner states, wherein said  $2^{K-2}$  local winner states are selected from  $2^{K-2}$  pairs of odd and even states, respectively, and said  $2^{K-1}$  states are divided into said  $2^{K-2}$  pairs of odd and even states;
- a best survivor unit for receiving said path metrics of said  $2^{K-2}$  local winner states from said add-compare-select module and selecting a best state from among said  $2^{K-2}$  local winner states every  $L$  iterations; and
- a survivor memory comprising:
  - a register-exchange network for receiving said decision bits of said  $2^{K-1}$  states from said add-compare-select module and generating decision vectors of survivor paths leading to said  $2^{K-1}$  states at instant  $i$  according to said decision bits of said  $2^{K-1}$  states from instant  $i-L$  to instant  $i$ , wherein said decision vectors of said  $2^{K-1}$  states are output every  $L$  iterations and each of said decision vectors has a length of  $L$  bits; and
  - a trace-back unit for storing said decision vectors of said  $2^{K-1}$  states and finding a global survivor path sequence by following said decision

vectors back from the best state at instant  $i-L$ , such that  $L$  decoded bits are output every  $L$  iterations.

8. (Original) The Viterbi decoder as recited in claim 7 wherein said best survivor unit comprises  $\gamma$  2-to-1 comparators for choosing the best state among said  $2^{K-2}$  local winner states by comparing said path metrics of said  $2^{K-2}$  local winner states in  $L-1$  iterations.

9. (Original) The Viterbi decoder as recited in claim 8 wherein the number of said 2-to-1 comparators,  $\gamma$ , is given by:

$$\gamma = \left\lceil \frac{2^{K-2} - 1}{L - 1} \right\rceil$$

where  $\lceil \cdot \rceil$  denotes a ceiling function.

10. (Original) The Viterbi decoder as recited in claim 7 wherein said number of  $L$  is equal to a divisible factor of a data payload length for a conformant 802.11g system.

11. (Original) The Viterbi decoder as recited in claim 10 wherein said number of  $L$  is equal to 8 for said conformant 802.11g system.

12. (Original) The Viterbi decoder as recited in claim 7 wherein said survivor memory features a decoding window length of  $\Gamma = L(L-2) + K - 1$ .

13. (Original) The Viterbi decoder as recited in claim 7 wherein said decision metrics are hard-decision data if quantized to one-bit precision.

14. (Original) The Viterbi decoder as recited in claim 7 wherein said decision metrics are soft-decision data if quantized with more than one bit of precision.